

Monthly Snowmass Newsletter (October 2020)

Recent Highlights and Upcoming Events

Organization and activities of Snowmass 2021 are available on the [Snowmass wiki page](#).

Snowmass Community Planning Meeting

The CPM 2020 took place virtually between October 4 and October 8 with about 3,000 participants (attendance information can be found [here](#)). The overall program, presentations and recordings are available at <https://indico.fnal.gov/event/44870/>. The primary goal of the CPM was to develop plans or steps (“Snowmass Planning”) to achieve a successful Snowmass 2021 report. On the first day of the CPM on October 5, we heard an inspiring talk about the field, strategies and plans in other regions and in related fields, remarks from funding agencies, and heard voices of our community. Breakout sessions on October 6th and 7th focused on establishing cross working-group connections and identifying gaps and areas for further study. They also provided space for members across the field to talk to each other and to discuss, promote, and develop new ideas. The final day’s program included a panel discussion on future global accelerator facilities, each frontier’s scientific questions and plans between October 2020 (CPM) and October 2021 (Report), and early careers’ activities and plans. The CPM ended with talks that will inspire the community’s engagement in defining the future. The meeting went extremely smoothly due to tireless work by the Local Organizing Committee (see the memberships below).

Community Planning Meeting: Local Organizing Committee



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Gordon Watts
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Snowmass Early Career

The early career community submitted over 150 letters of interest and was actively involved in the CPM. The diversity, equity, and inclusion initiatives are beginning a journal club, which will meet every other Wednesday at 2 pm ET, starting October 21st. We have also begun to gather information on existing early career groups within high energy physics to build a network of these groups. We had over 200 members of the community at large sign up for Coffee Collisions for informal one-on-one networking, and the first matches will be made by the end of the month. We will also be holding a colloquium series focused on the big questions in the field. The first colloquium in the series will be held on Friday, October 30th from 12-1:30 p.m. ET and will focus on dark matter. These are just a small portion of what is happening within

Snowmass Early Career (SEC), and we welcome any early career member, including those on non-academic tracks, to join us at any time! All SEC meetings are posted on the [indico](#).

Community Engagement Frontier

The Community Engagement Frontier (CEF) organized several sessions during the CPM. In an Introduction session, we reviewed the plans for CEF sessions at the CPM and discussed the grouping of LOIs into white paper study groups. We co-led breakout sessions on cross-community mobility in science and a joint session between CEF and AF on HEP and Accelerator workforce, career and training. Further, we had another session dedicated to connections with industry. CEF also organized a plenary session which included a presentation on structural changes in support for public engagement with science in South Africa; this was meant as an example of how in South Africa, structural changes to address CEF issues were addressed at the government, institution and professional association levels. The second part of the plenary session at CPM was a panel discussion where CEF liaisons answered questions on CEF issues in the Frontiers that they are serving. In another dedicated CEF planning session, we discussed how to organize CEF activities between the CPM and the CSS and how to align our activities with the timeline proposed by the Steering Committee. Finally, we recalled all the salient points of our discussions in the summary talk where we also pointed out the community-wide survey organized by CEF to solicit broader inputs.

Theory Frontier

The Theory Frontier (TF) participated in the organization of 26 breakout sessions at the CPM meeting, spanning every Snowmass frontier and all eleven TF topical groups, and welcomed the participation of 380 (295) registrants listing the TF as their primary (secondary) field. The breakout sessions focused the development of plans for inter-frontier whitepaper solicitations and highlighted areas for further coordination both between frontiers and within the TF. Following the CPM, the TF is in the process of developing plans for a number of cross-frontier workshops, including joint events with the Accelerator, Computing, Energy, Neutrino, & Rare and Precision frontiers.

Energy Frontier

The Energy Frontier (EF) organized [~27 breakout sessions](#) at the CPM meeting. The participation at the breakout sessions varied between 50-250. A broad spectrum of topics was covered by the multiple breakout sessions, with plenty of opportunities for discussing new ideas and planning activities of Energy Frontier and across multiple Frontiers [Cosmic, Theory, Rare and Precision, Accelerator, Computational, and Instrumentation]. The EF introduction session focused on defining the key questions of the EF physics program with emphasis on improving the measurement precision, discovery reach for new particles, and the accuracy of theoretical calculations. A comprehensive set of benchmark future collider options which include both Higgs factories and future high energy discovery machines were discussed. The EF planning session featured engagement opportunities for early career members in EF topical groups. In addition, EF Monte Carlo generation plans were summarized and a call was issued for volunteers for the Monte Carlo production team. The EF team would like to hear from the community about the group's activities and organization, and how we can do better via the ["EF Survey"](#).

Neutrino Frontier

The Neutrino Frontier helped co-organize 18 different parallel sessions at the CPM meeting, covering many cross-cutting topics. From discussions in these were identified various follow-up action items, including plans for additional workshops. Several potential topics for white papers were identified. We are planning an NF “white paper kickoff” workshop in the November/December time frame. Please keep an eye on the [NF calendar](#) for updates.

Rare and Precision Frontier

The Rare and Precision Frontier had a Town Hall the Friday before the CPM when almost all the LOIs were presented, together with plenary talks from multi-purpose experiments and facilities that spanned multiple topical groups. We began the CPM with a review of the major themes that emerged during the Town Hall. The RPF collaborated in organizing 17 parallel sessions ranging from instrumentation to EFTs. We continued our workshops in the last month, with one on dipole moments, one on LFV and LUV in meson decays, and one each on light quark exotic hadrons, on heavy quark conventional hadrons, heavy quark exotic hadrons, and CLFV heavy state decays. We are starting to organize discussions about combining LOIs into broader white papers and planning both our detailed schedule for the period until Snowmass and our Frontier-wide meeting.

Cosmic Frontier

The Cosmic Frontier continues to hold regular topical working group meetings, after a series of productive CPM sessions. Working groups are gearing up for focused community meetings on different topics in the next few months with the goal of converging on a series of white papers. We expect to announce dates for them in the next few weeks via the wiki page and slack channels.

Accelerator Frontier

The Accelerator Frontier had organized 32 sessions at the CPM, including joint ones with EF, NF, RPF, IF and CEF. More than 250 people registered for these events which helped to develop plans for all 7 AF topical groups. 34 workshops, meetings and events are planned to take place before the CSS, including two international ones, four with EF, and at least one with each of NF, IF, and RPF. The spectrum of topics to discuss is expected to be broad and include not only well-established projects, but also new, potentially promising machines such as ERL-based ones, gamma-gamma and plasma-based colliders, very high energy muon colliders and ultimate beams, etc. The AF Implementation Task Force, recently charged to develop a set of metrics that will be used to compare the proposals and concepts, will focus on collider facilities and evaluate their performance, construction cost, schedule/timeline, physics reach, technical risks and R&D status and plans, operating and lifecycle costs and environmental impact. The ITF outcome will be presented to the AF topical groups for comments and feedback at a workshop in Spring 2021, and summarized in a White Paper.

Computational Frontier

Those involved with the computational frontier were very busy at the CPM, where a component of many parallel sessions had a computing angle. There were two frontier-wide sessions, with an [introduction and letter of intent overview](#) on Tuesday and a [planning meeting](#) on Wednesday. A summary of the CPM for

the computational frontier [was presented on Thursday](#). The frontier is now looking forward to the reports from the topical groups, and we will be working with the community to ensure that the needs of HEP computing are well represented in the Snowmass documentation.

Instrumentation Frontier

The Instrumentation Frontier (IF) co-organized 19 parallel sessions during the CPM. Some broad concepts, as well as specific topics on detector requirements for different planned experiments have been presented and discussed. CPAD status was introduced and a high-level summary on all IF related LOIs was also presented. An IF planning session was scheduled for following up the key information collected from parallel sessions and planning the next steps. One of the upcoming highlights is the MultiHEP workshop organized by our Cross Cutting topical group ([indico](#)). Over the next months we will work on internalizing all submitted LOIs and planning consolidated white papers. Our next community wide workshop will take place as the CPAD workshop in March 2021.

Underground Facility and Infrastructure

The Underground Facility and Infrastructure (UF) group took good advantage of the CPM, which had a focus on cross-cutting topics across Frontiers. UF conveners and topical conveners helped co-organize eight parallel breakout sessions as well as participating in parallel sessions organized by the other Frontiers. It was clear the community sees a need for underground facilities to support future science, including most visibly neutrino physics and searches for dark matter, but also including other synergist research in areas of quantum information science, gravity, microbiology, geology, and nuclear astrophysics. A complete summary of UF engagement at CPM is available on [indico](#). Moving forward, in addition to teaming with the other Frontiers, the UF group is anticipating using surveys to understand the needs of the community. For example, a survey is now available to collect information related to supporting capabilities for underground science ([link](#)).